

A hand reaching over a field of golden wheat under a warm, yellow light.

# In Situ Root Growth with Mini-Rhizotrons:

Lessons from Elevated CO<sub>2</sub> and  
Genotypic Variability Experiments

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# Acknowledgements



**GRDC** Grains Research &  
Development Corporation



**Australian Government**  
**Department of Agriculture**  
**Australian Research Council**



Primary Industries Climate Challenges Centre



 **USA Dry Pea  
& Lentil Council**





<https://www.cid-inc.com/plant-science-tools/root-measurement-with-minirhizotron/ci-600-in-situ-root-imager/>



## Root Growth in the Australian Grains Free Air CO<sub>2</sub> Enrichment Facility

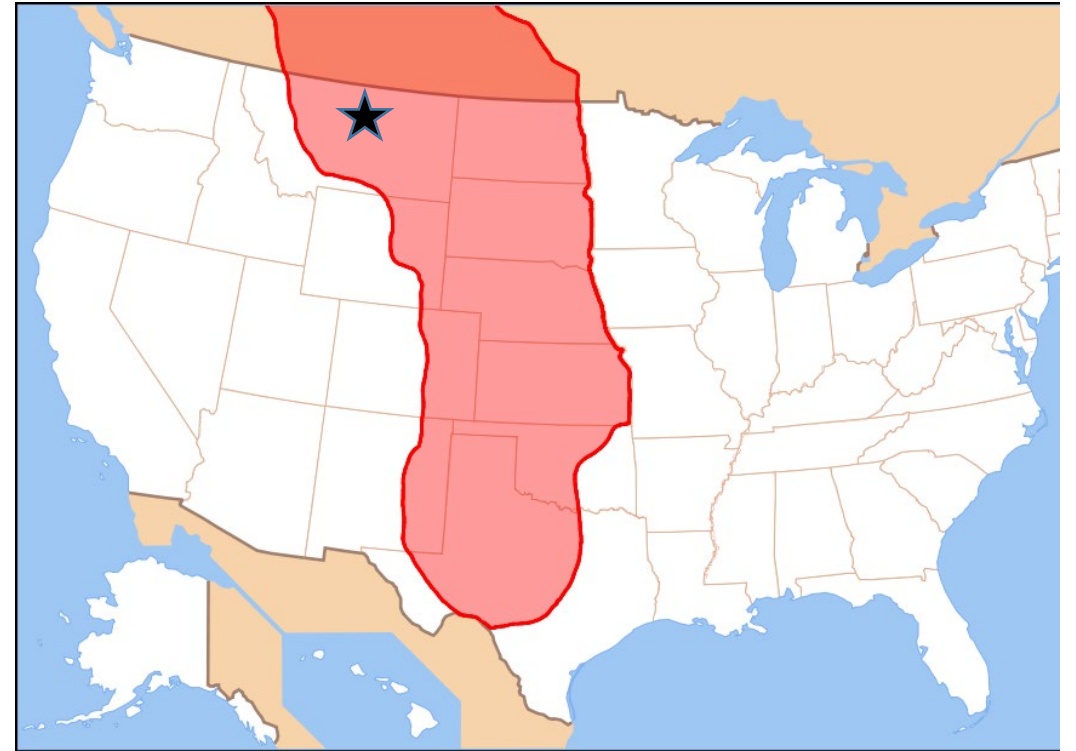
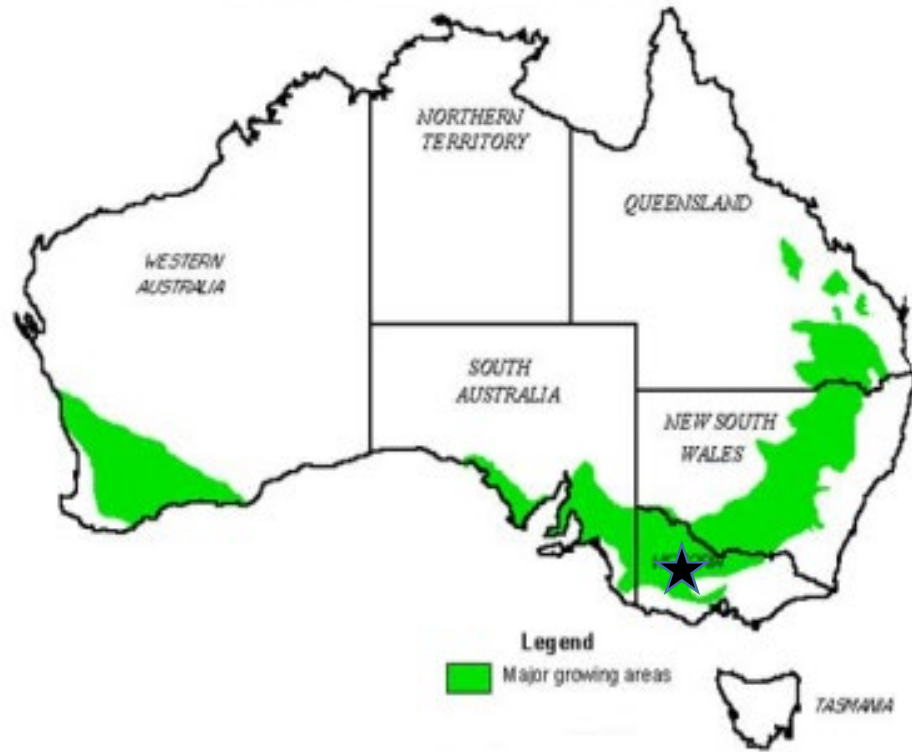


## Phenotyping Root Growth in Field Peas and Lentils in Montana





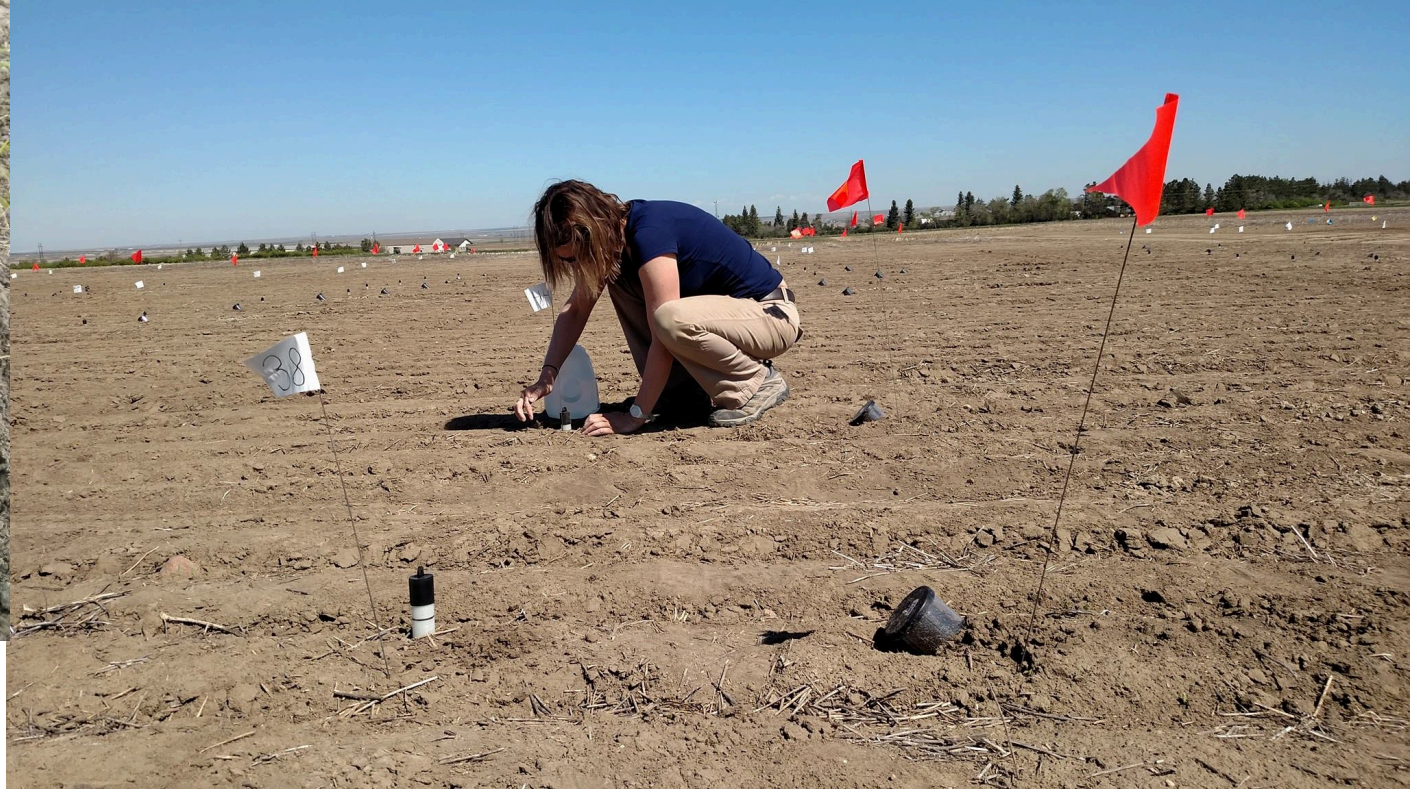
## Australia winter wheat



















Undo



Redo



Pan &amp; Zoom

Add/Edit  
Points

Auto Detect

Remove  
Points

Lock Points



Root Color

Measure  
ManuallyEstimate  
Root %Image  
BrightnessImage  
ContrastImage  
GammaShow/Hide  
RootsShow/Hide  
PixelsShow  
Fullscreen

Current Tube

1



Current Window

2



Current Session

1



0.00 mm

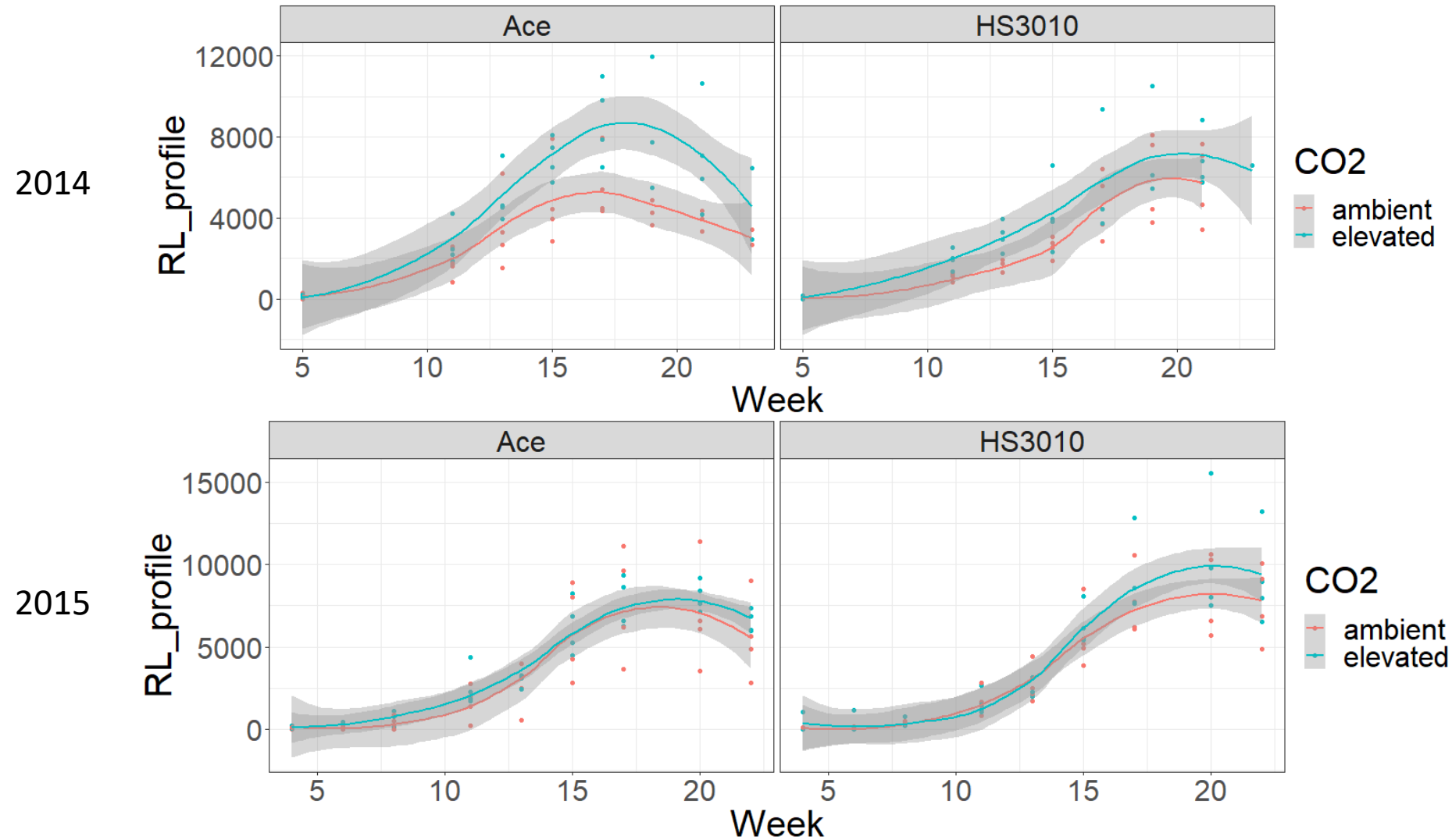
21.50 cm

43.10 cm

I  
21.85 mm

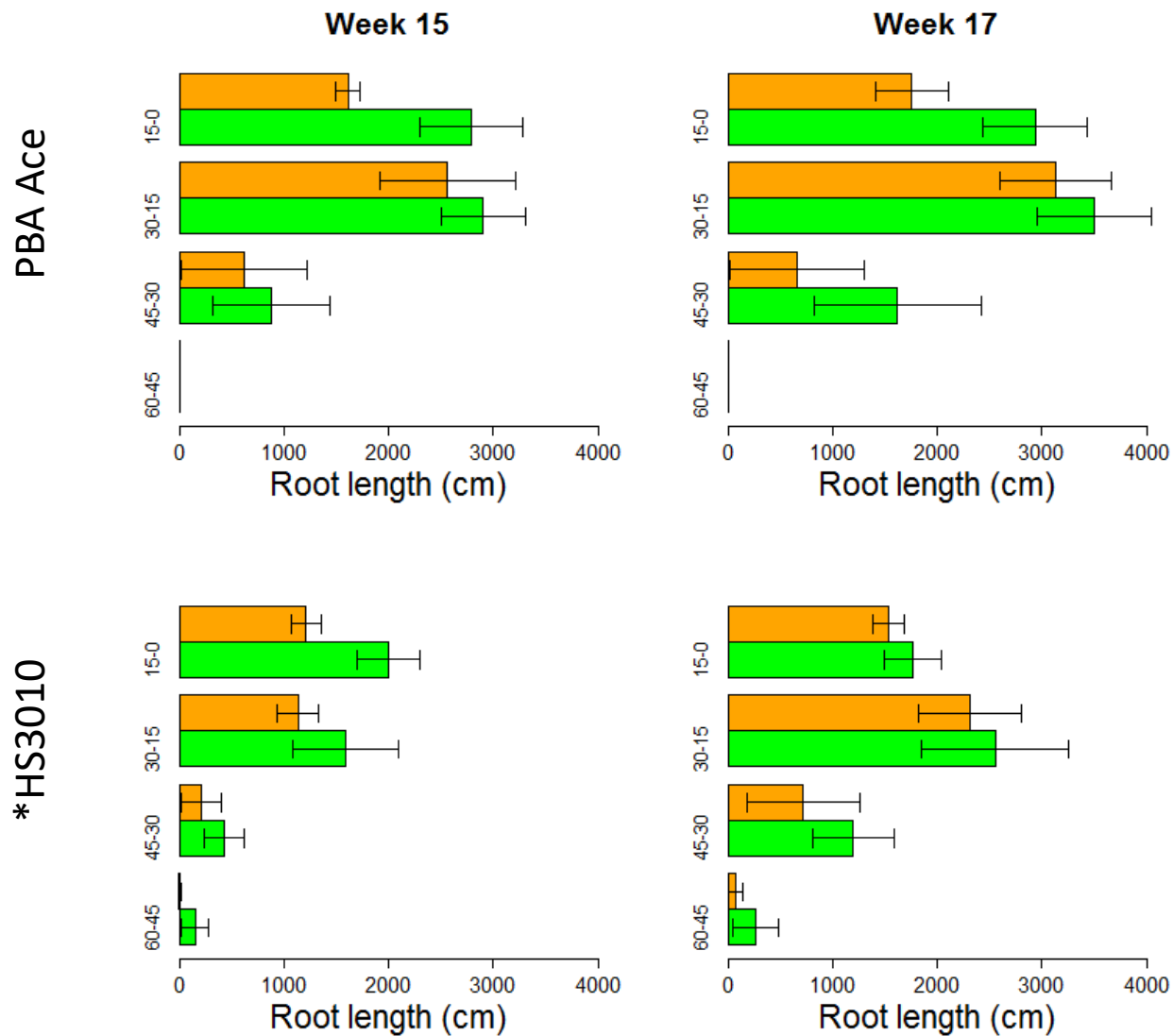


# Preliminary Results - AGFACE





# AGFACE 2014

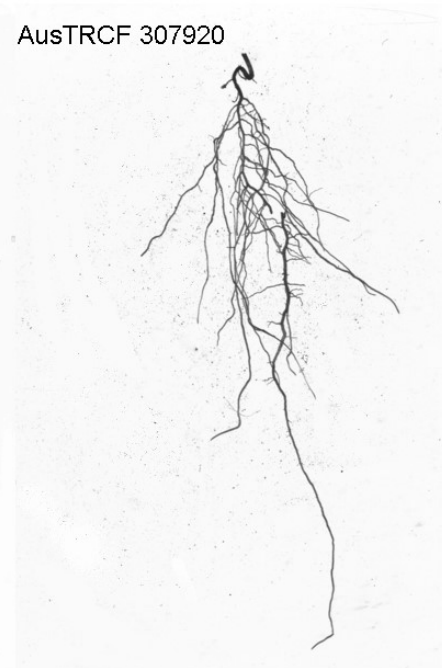




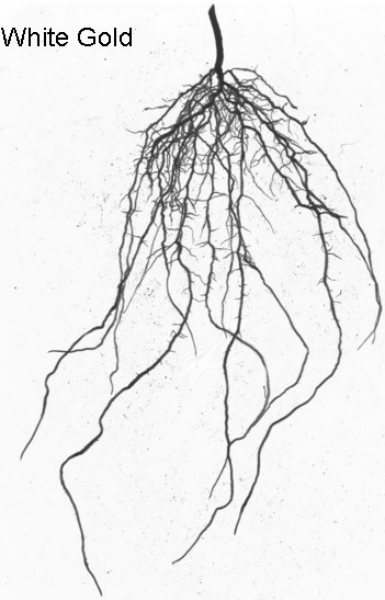
Mungbean  
landrace



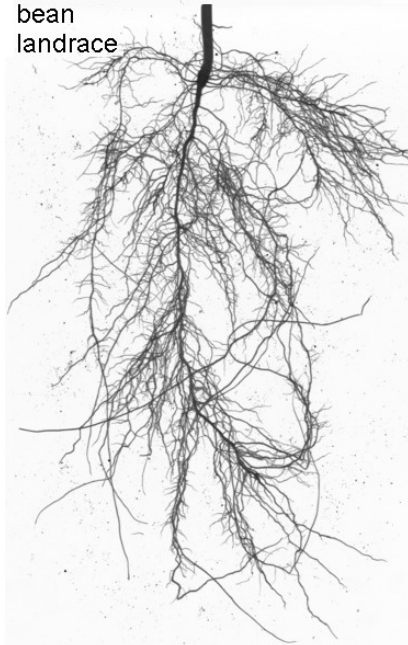
AusTRCF 307920



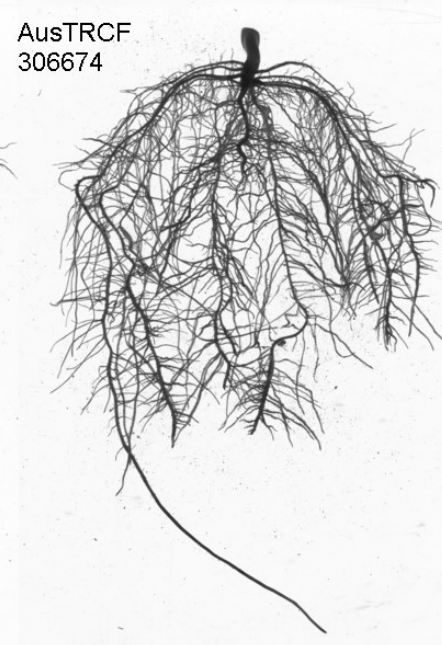
White Gold



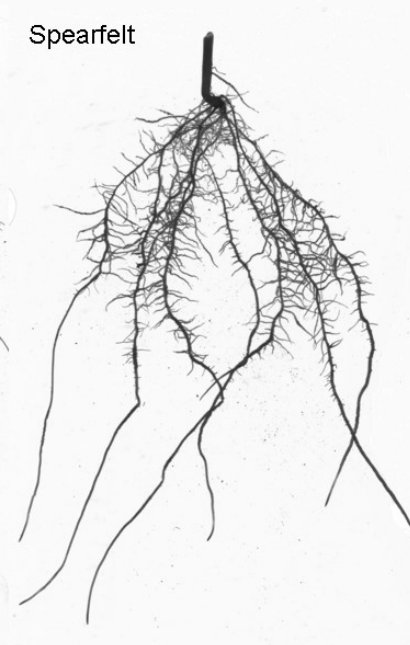
Common  
bean  
landrace



AusTRCF  
306674

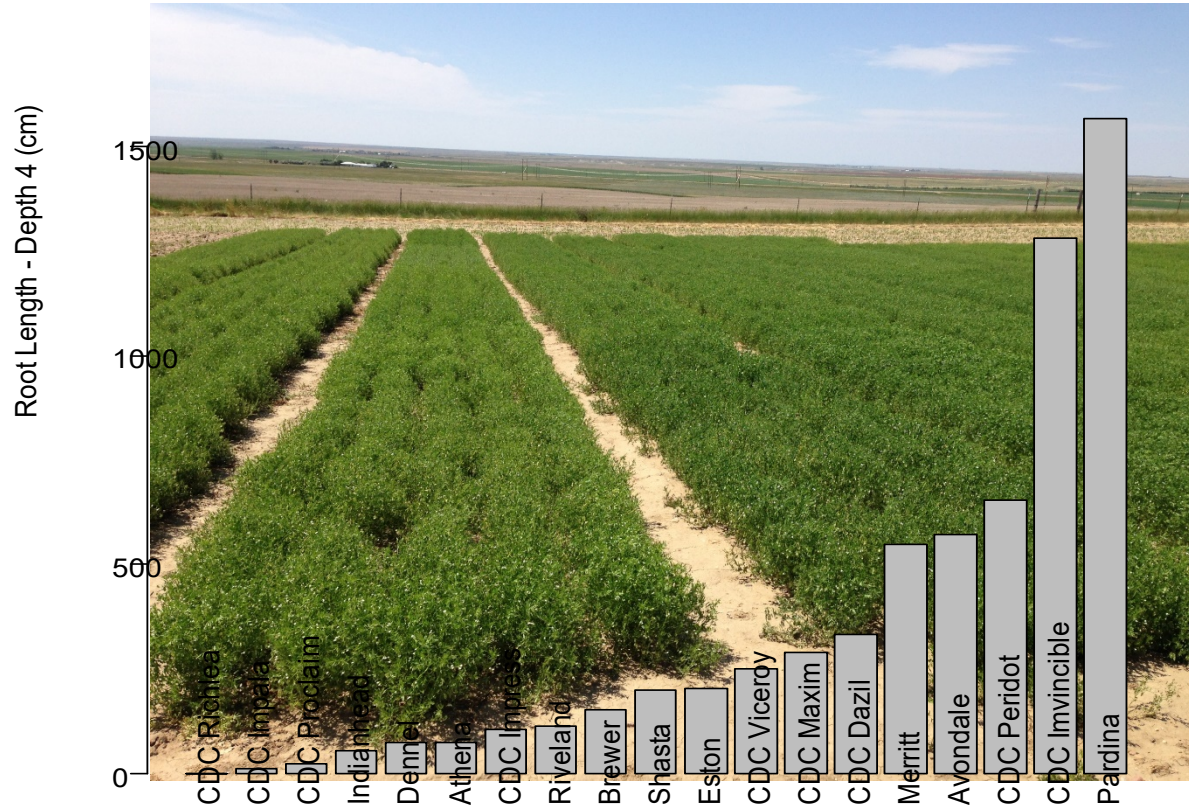


Spearfelt





# Preliminary Results - Phenotyping





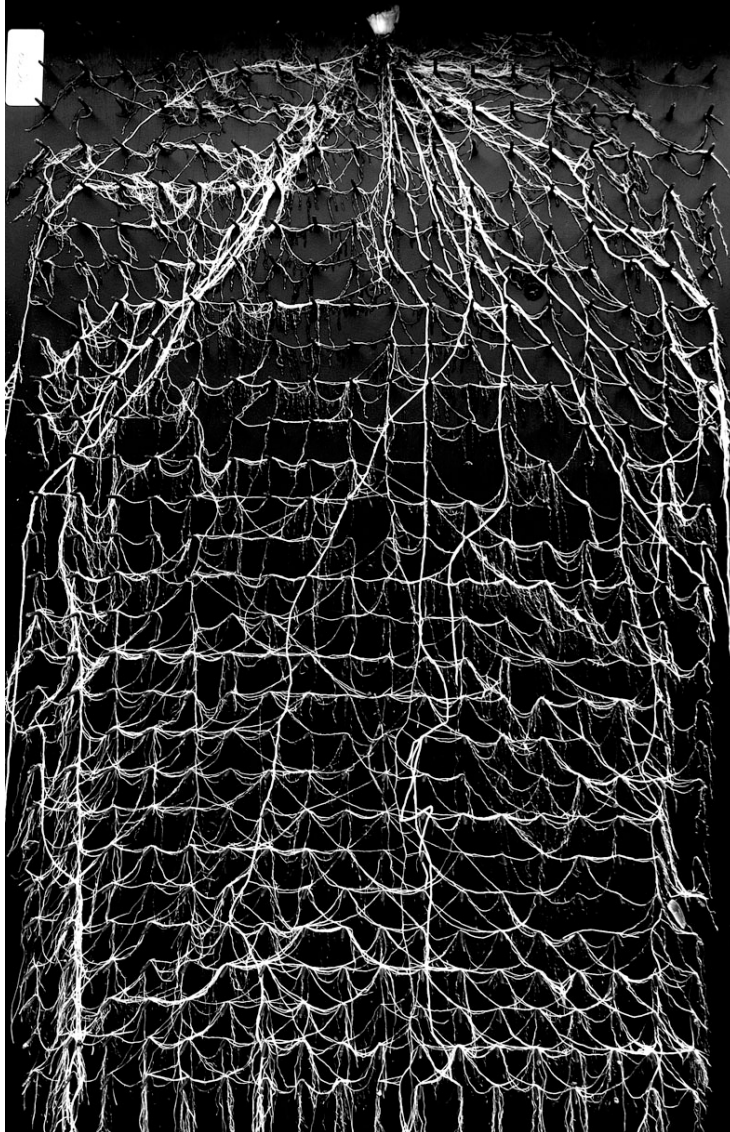


Stay-Green Parents:  
Barley and Wheat Cultivars

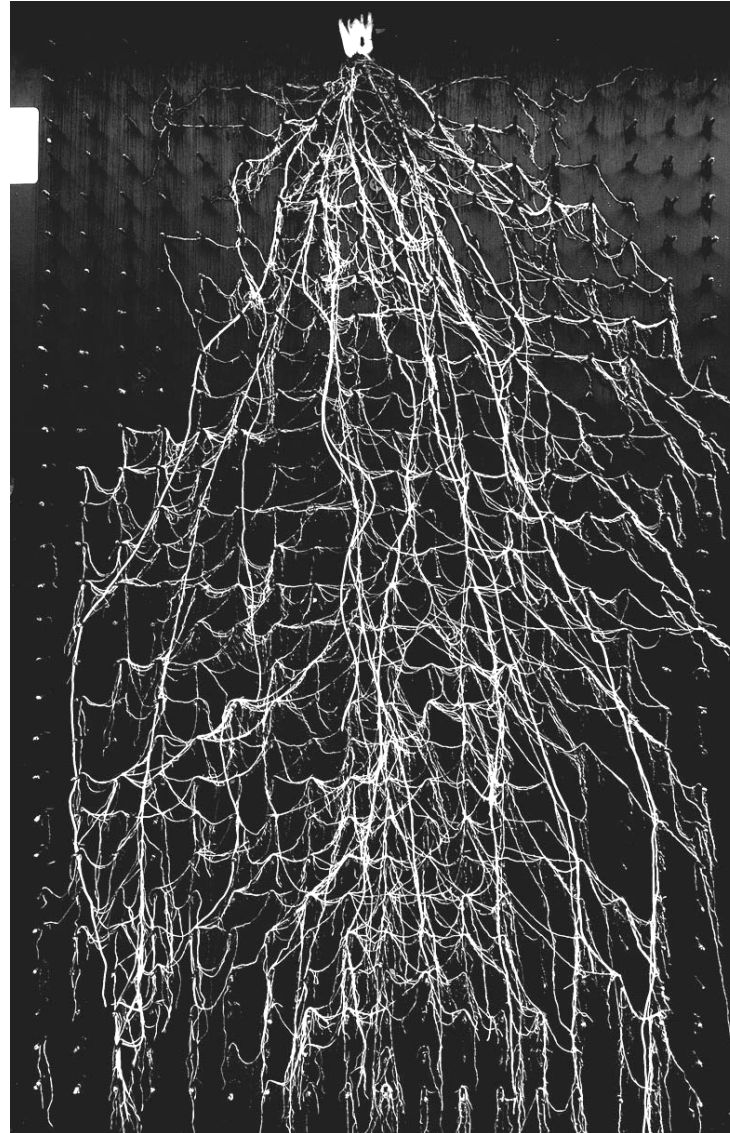
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Hartog



Seri

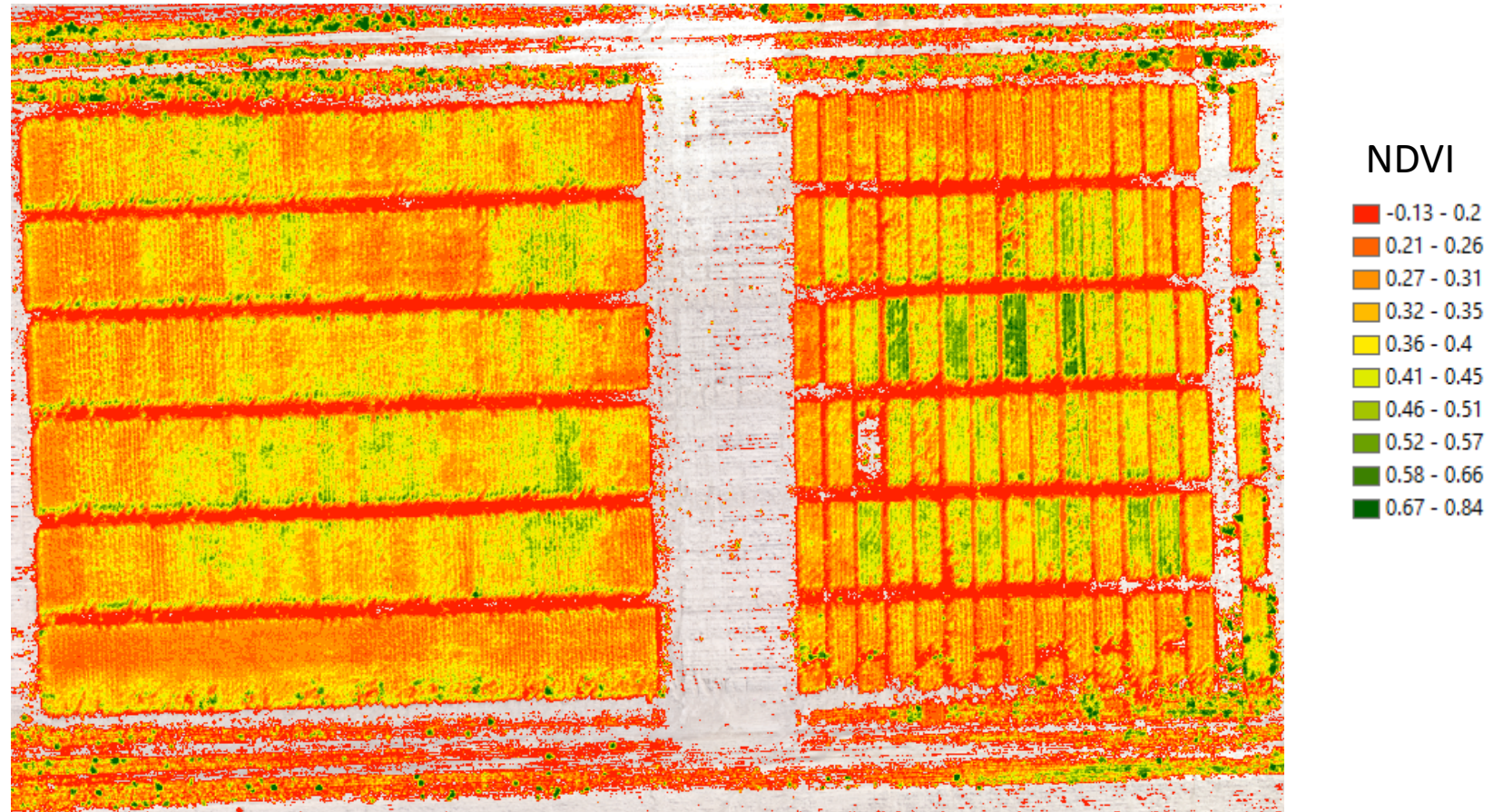


Manschadi et al., 2006. FPB 33: 823-837

Manschadi et al., 2008. Plant & Soil 303: 115-129



# Phenotyping Root Growth in Wheat and Barley Stay-Green/Low protein parents





# Questions?

## Thank you!

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